a substrate holder that positions a substrate in the reaction zone;

said substrate holder comprising a low frequency (LF) electrode;

a gas distribution system that includes a gas inlet manifold for supplying one or more process gases to said reaction zone;

said gas inlet manifold comprising a high frequency (HF) electrode;

a plasma power source for forming a plasma within the reaction zone of said deposition chamber, the plasma power source comprising a high frequency power supply coupled with the HF electrode and a low frequency power supply coupled with the LF electrode;

an impedance monitor comprising a first impedance probe electrically coupled to said high frequency electrode to measure the impedance at the HF electrode and a second impedance probe electrically coupled to said low frequency electrode to measure the impedance at the LF electrode; and

a processor coupled with the impedance monitor for adjusting processing conditions of the deposition chamber based on measurements by the first impedance probe and the second impedance probe.

16. A substrate processing system comprising:

a deposition chamber comprising a reaction zone;

a substrate holder that positions a substrate in the reaction zone;

said substrate holder comprising a low frequency (LF) electrode;

a gas distribution system that includes a gas inlet manifold for supplying one or more process gases to said reaction zone;

said gas inlet manifold comprising a high frequency (HF) electrode;

a plasma power source for forming a plasma within the reaction zone of said deposition chamber, the plasma power source comprising a high frequency power supply coupled with the HF electrode and a low frequency power supply coupled with the LF electrode;

an impedance monitor electrically coupled to said high frequency electrode and said low frequency electrode;

a computer processor communicatively coupled to said impedance monitor so that said computer processor receives as an input the measured impedance level of said plasma;

a variable capacitor electrically coupled to said chamber and controllably coupled to said processor wherein said processor adjusts a capacitance level of said variable capacitor to vary the impedance of said plasma in response to an output of said impedance monitor; and

a matching network electrically coupled to a high frequency RF generator and said gas manifold, wherein said matching network has capacitors that are different than said variable capacitor.

20. A substrate processing system comprising:

a deposition chamber comprising a reaction zone;

a substrate holder that positions a substrate in the reaction zone;

said substrate holder comprising a low frequency (LF) electrode;

a gas distribution system that includes a gas inlet manifold for supplying one or more process gases to said reaction zone;

said gas inlet manifold comprising a high frequency (HF) electrode;

a plasma power source for forming a plasma within the reaction zone of said deposition chamber, the plasma power source comprising a high frequency power supply coupled with the HF electrode and a low frequency power supply coupled with the LF electrode;

an impedance monitor electrically coupled to said high frequency electrode and said low frequency electrode, said impedance monitor including an impedance monitor variable capacitor;

a processor communicatively coupled to said impedance monitor for receiving as an input a measured impedance level of said plasma;

a variable capacitor electrically coupled to said LF electrode and controllably coupled to said processor wherein said processor adjusts a capacitance level

of said variable capacitor to vary the impedance of said plasma in response to an output of said impedance monitor; and

a matching network coupled between a low frequency RF generator and said variable capacitor, wherein said matching network includes capacitors that are different than said variable capacitor.

REMARKS

Claims 3-6, 11-14, 16, 19-21, 23, 24, and 26-30 are pending. Claims 11, 16, and 20 have been amended to correct minor informalities. No new matter has been introduced, and no new issue has been raised. Applicants believe the claims comply with 35 U.S.C. § 112.

In the Advisory Action dated March 15, 2002, the Examiner refused entry of the Amendment filed on February 11, 2001 on the ground that "they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal."

Claim 16 has been amended to recite a matching network electrically coupled to a high frequency RF generator and said gas manifold. In the Office Action dated December 10, 2001, the Examiner rejected claim 16 under 35 U.S.C. § 112, second paragraph, as being indefinite, and stated that "applicant should amend `coupled' to the more accurate `electrically coupled' for consistency with the specification and removal of ambiguity." Applicants have adopted the Examiner's suggestion and amended claim 16 accordingly. This proposed amendment overcomes the rejection under 35 U.S.C. § 112, second paragraph, and thus places the application in better form for appeal by materially reducing or simplifying the issues for appeal. Therefore, Applicants believe entry of the proposed claim amendment is proper.

In addition, claims 11, 16, and 20 have been amended to recite that the plasma power source comprises a high frequency power supply coupled with the HF electrode and a low frequency power supply coupled with the LF electrode.